AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A symmetric type image filter processing apparatus, which processes image data by a symmetric type image filter composed of N × M kernel coefficients, ~~(N and M are odd numbers being 3 or more integers)~~, comprising:

an operating means that multiplies kernel coefficients of ~~the right side~~ one or more ~~column~~columns ~~or the left side column for~~ on the left or on the right of ~~the~~ a center column by column elements of image data corresponding to said ~~right side column or said left side column~~one or more columns and cumulatively adds the multiplied results;

a memorizing means that memorizes operation results ~~being multiplied and cumulatively added results operated~~generated at said operating means as intermediate data; and

a pixel value calculating means that calculates pixel values of said image data by cumulatively adding said intermediate data ~~memorizing~~memorized in said memorizing means.

2. (currently amended): A symmetric type image filter processing apparatus in accordance with claim 1, wherein:

said operating means ~~multiplies said kernel coefficients of the right side column or the left side column by said column elements of said image data corresponding to said right side column or said left side column and cumulatively adds the multiplied results, and~~ calculates intermediate data in one row of said image data, and

said pixel value calculating means reads out said intermediate data corresponding to the position of each pixel of said image data, and calculates said pixel value by cumulatively adding said read out intermediate data.

3. (original): A symmetric type image filter processing apparatus in accordance with claim 1 or 2, wherein:

said operating means and said pixel value calculating means execute the operation of said multiplication and said cumulative addition by using SIMD commands.

4. (currently amended): A symmetric type image filter processing apparatus in accordance with claim 1, wherein:

the number of pixels in one row of said image data is P (P is a positive integer), and

said operating means multiplies each kernel coefficient of M pieces in each column of { (N + 1) / 2 } columns at said right or left ~~side~~ of said center column by each pixel of M pieces in the column direction of said image data and cumulatively adds the multiplied results, by using SIMD commands that are capable of processing data of sequential Q pieces simultaneously (Q > 1 and Q is a positive integer satisfying the condition P > Q), and executes this multiplying and cumulatively adding operation P / Q times, and generates said intermediate data in one row of said image data.

5. (currently amended): A computer-readable storage medium storing a program for making a computer work to execute filter processing to image data by using a symmetric type image filter composed of N × M kernel coefficients (N and M are odd numbers being 3 or more integers), said program comprising:

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an operating step that multiplies kernel coefficients of ~~the right side column or the left side column for~~one or more columns to the left or to the right of ~~the~~a center column by column elements of image data corresponding to said ~~right side column or said left side column~~ one or more columns and cumulatively adds the multiplied results;

a memorizing step that memorizes operation results ~~being multiplied and cumulatively added results operated~~generated at said operating step as intermediate data; and

a pixel value calculating step that calculates pixel values of said image data by cumulatively adding said intermediate data memorized at said memorizing step.

6. (currently amended): A computer-readable medium storing a program for making a computer work to execute filter processing to image data in accordance with claim 5, wherein:

said operating step ~~multiplies said kernel coefficients of the right side column or the left side column by said column elements of said image data corresponding to said right side column or said left side column and cumulatively adds the multiplied results, and~~ calculates intermediate data in one row of said image data, and

said pixel value calculating step reads out said intermediate data corresponding to the position of each pixel of said image data, and calculates said pixel value by cumulatively adding said read out intermediate data.

7. (currently amended): A computer-readable medium for storing a program for making a computer work to execute filter processing to image data in accordance with claim 5 or 6, wherein:

said operating step and said pixel value calculating step execute the operation of said multiplication and said cumulative addition by using SIMD commands.

8. (currently amended): A computer-readable medium for storing a program for making a computer work to execute filter processing to image data in accordance with claim 5, wherein:

the number of pixels in one row of said image data is P (P is a positive integer), and

said operating step multiplies each kernel coefficient of M pieces in each column of { (N + 1) / 2 } columns at said right or left sideof said center column by each pixel of M pieces in the column direction of said image data and cumulatively adds the multiplied results, by using SIMD commands that are capable of processing data of sequential Q pieces simultaneously (Q > 1 and Q is a positive integer satisfying the condition P > Q), and executes this multiplying and cumulatively adding operation P / Q times, and generates said intermediate data in one row of said image data.

9. (currently amended): A method for processing image data by a symmetric type image filter composed of N × M kernel coefficients (N and M are odd numbers being 3 or more integers), comprising the steps of:

multiplying kernel coefficients of the right side column or the left side column forof one or more columns on the left or on the right of thea center column by column elements of image data corresponding to said right-side column or said left side column-one or more columns and cumulatively adding the multiplied results asto generate intermediate data;

memorizing operation results being multiplied and cumulatively added results said intermediate data; and

calculating pixel values of said image data by cumulatively adding said intermediate data being memorized.

10. (currently amended): A method for processing image data in accordance with claim 9, wherein:

said intermediate data is calculated in one row of said image data are calculated by multiplying said kernel coefficients of the right side column or the left side column by said column elements of said image data corresponding to said right side column or said left side column and cumulatively adding the multiplied results, and

said pixel values are calculated by reading out said intermediate data corresponding to the position of each pixel of said image data, and by cumulatively adding said read out intermediate data.

11. (original): A method for processing image data in accordance with claim 9 or 10, wherein:

said multiplying operation and said cumulatively adding operation and said pixel value calculating operation are executed by using SIMD commands.

12. (currently amended): A method for processing image data in accordance with claim 9, wherein:

the number of pixels in one row of said image data is P (P is a positive integer), and

said intermediate data in one row of said image data are generated by P / Q times of said multiplying and cumulatively adding operation that multiplies each kernel coefficient of M pieces in each column of { (N + 1) / 2 } columns at said right or left side of said center column by each pixel of M pieces in the column direction of said image data and cumulatively adds the multiplied results, by using SIMD commands that are capable of processing data of sequential Q pieces simultaneously (Q > 1 and Q is a positive integer satisfying the condition P > Q).

13. (new): The apparatus of claim 1, wherein said operating means utilizes less than all the N x M kernel coefficients during said multiplication.

14. (new): The apparatus of claim 1, wherein the pixel value calculating means stores the calculated pixel values of said image data in an operation result pixel storing region.

15. (new): The program of claim 5, further comprising a step of storing the pixel value calculating means stores the calculated pixel values of said image data in an operation result pixel storing region.

16. (new): The method of claim 9, further comprising a step of storing the pixel value calculating means stores the calculated pixel values of said image data in an operation result pixel storing region.